

Remarks

Applicant has reviewed the Office Action dated as mailed March 7, 2006. After the above amendments have been made, the present application contains claims 1-30. Claims 1, 5, 22 and 25 have been amended. New claims 29-36 have been added. No new matter has been added by the above amendments.

Claim Rejections Under 35 U.S.C. §103

Claims 1-3, 6-8, 10-14, 17, 20-21 and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hale et al. (U.S. Patent 5,317,394; hereinafter Hale), in view of Ferguson (U.S. Patent 5,343,313; hereinafter Ferguson) and Groves et al. (U.S. Patent 5,414,439; hereinafter Groves). This rejection is respectfully traversed. Applicant respectfully submits that this rejection under 35 U.S.C. §103 does not follow the M.P.E.P. § 706.02(j) which states:

“After indicating that the rejection is under 35 U.S.C. §103, the examiner should set forth in the Office Action:...(B) the difference or differences in the claim over the applied reference(s), (C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and (D) an explanation of why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification... the teaching or suggestion to make the claimed combination and the reasonable expectation of the success must both be found in the prior art and not based on Applicant’s disclosure.” *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438(Fed. Cir. 1991).

As discussed in detail below, Applicant respectfully submits that there is no teaching or suggestion in Hale, Ferguson and Groves that their teachings may be combined so as to provide the present invention as recited in the claims and such motivation only comes from Applicant’s disclosure. This approach constitutes impermissible hindsight and must be avoided. Ferguson in column 20, lines 55-62 recites:

“Operation of the modified system 210 enables the individual whose eye 227 is represented in the drawing of FIG. 11, for example, still to operate the aircraft and/or other vehicle intended to be operated even when eye protection function is in operation to block input of light from outside the visor reaching the eyes 227. Such capability is provided by using the heads up display 213 to project for viewing by the operator (pilot, for example) an image that can be relied on to continue operating the aircraft and/or other vehicle. Such image may be, for example, an image, whether real, stored, recreated (e.g., cartoon-like), etc., that represents what it is expected would timely be seen if one were to look outside the vehicle. Alternatively, such image may be, for example, an artificial

horizon image that would enable a pilot to continue flying an aircraft for a period of time even though other optical input to the pilot's eyes, i.e., of the real space outside the aircraft, were not viewable." (emphasis added)

Accordingly, Ferguson teaches that the image is presented to the operator when the real space outside the aircraft is not viewable. Accordingly, Ferguson teaches away from the present invention as recited in the claims that permits images generated from sensors to be superimposed on the real space images. Therefore, a person of skill in the art would not be motivated to combine the teachings of Ferguson with Hale and Groves so as to provide the present invention as recited in the claims.

Additionally, Groves teaches a motor vehicle equipped with an infrared camera for viewing roadway conditions in terms of a thermal image, and outputs a video signal to a head up display (HUD) which projects the camera view to the operator via the windshield or other combiner to display a virtual image in the operator's field of view. Accordingly, Groves teaches a single infrared camera. Because Groves is only interested in viewing roadway conditions, there is no need for an array of vision sensors as taught by Hale. Furthermore, Groves teaches that the virtual image is projected on the windshield or other combiner and there is no teaching or suggestion in Groves of a helmet and eye protection system or any need for such a system as provided by Ferguson. Therefore, a person of skill in the art would not be motivated to combine the teachings of Groves with Hale and Ferguson and such motivation only follows from the present invention which is impermissible hindsight under M.P.E.P. § 706.02(j) as recited above.

Even if it were proper to combine the teachings of Hale, Ferguson and Groves, they still would not provide the present invention as recited in the claims. Claim 1 has been amended to recite:

"wherein both the images generated by the output signal and the real images are in conformity with one another, to create a seamless effect for the operator and wherein images generated by the output signal include an exterior view relative to the vehicle that is at least partially blocked by the real image viewable by the operator but is displayable superimposed and in conformity with the real image."

The Office Action on page 3 admits that Hale fails to disclose a see-through visor and the images output from a processor and the real images are in conformity with one another to create a seamless effect for the operator. Ferguson was cited for teaching a method for superimposing a

virtual image on a see-through visor; however, as recited above from Fergason, Fergason teaches that the virtual image is presented only when the eye protection visor is blocking outside light from reaching the eyes of the wearer and therefore real space outside the aircraft is not viewable.

Groves in column 3, lines 27 – 40 recites:

“The aspheric mirror 20 is positioned to project the image to the windshield 22 or other combiner where it is reflected to the operator 24 as a virtual image which appears to be just at the front of the vehicle. The size of the image is consistent with the real scene observed by the operator. For example, if an object subtends an angle of one degree in the real image, the virtual image would also subtend an angle of one degree. The location of the image may be low in the windshield or just above the end of the headlight range in the windshield. It also may be registered with the real image; in that case, the image should be projected a large distance in front of the vehicle to reduce parallax arising from the distance between the camera and the operator’s eyes.” (emphasis added)

Accordingly, Groves teaches that the size of the image is consistent with the real scene observed by the operator but Groves does not teach or suggest that the images are in conformity with one another as provided by the present invention as recited in Claim 1. Further, Groves teaches that the image may be low in the windshield or just above the end of the headlight range in the windshield which does not require that the images be in conformity as required by the present invention as recited in Claim 1. Furthermore, there is no teaching or suggestion in any of the cited documents that the images generated by the output signal include an exterior view relative to the vehicle that is at least partially blocked by the real image viewable by the operator but is displayable superimposed and in conformity with the real image as recited in Claim 1 above.

For all of the reasons discussed above, Claim 1 is submitted to be patentably distinguishable over Hale, Fergason, and Groves, whether considered individually or combined, and reconsideration and withdrawal of the 35 U.S.C. § 103 rejection of Claim 1 is respectfully solicited.

Turning now to the rejection of Claims 2-3, 6-8, 10-14, 17, and 20-21, these claims recite additional features which further patentably distinguish over Hale, Fergason and Groves. For example, none of the cited documents teach or suggest the specific field of view parameters recited in 6-8, 10 and 11. None of the cited documents recite that at least one of the vision sensors additionally provides an infrared search and track function as provided by the present

invention as recited in claim 12. None of the cited documents recite generating a real-time may signal that is combined by the processor into the output signal and displayed on the display outside an image produced by the array of vision sensors as provided by the present invention as recited in claim 17. Additionally, claims 2-3, 6-8, 10-14, 17 and 20-21 depend either directly or indirectly from independent Claim 1. Because of that dependency, these claims contain all of the features of independent Claim 1. Accordingly, these claims are also submitted to be patentably distinguishable over Hale, Ferguson and Groves, and reconsideration and withdrawal of the 35 U.S.C. § 103 rejection of these claims is respectfully requested.

Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hale in view of Ferguson, Groves and further in view of Hale et al. (U.S. Patent 5,418, 364; hereinafter Hale '364). This rejection is respectfully traversed. As previously discussed, Hale, Ferguson and Groves cannot be properly combined. Even if it were proper to combine these documents, they still would not provide the present invention as recited in the claims. Claim 9 depends indirectly from independent claim 1. Because of that dependency, claim 9 contains all of the features of claim 1 and any intervening claims. Applicant respectfully submits that Hale '364 adds nothing to the teaching of the other cited documents so as to render claim 1 unpatentable. Accordingly, claim 9 is also submitted to be patentably distinguishable over the cited documents, and reconsideration and withdrawal of the Section 103 rejection of claim 9 is respectfully solicited.

Claims 4-5 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hale in view of Ferguson, Groves and further in view of Myrick (U.S. Patent 5,166,789; hereinafter Myrick). This rejection is respectfully traversed. As previously discussed, there is no motivation to combine the teachings of Hale, Ferguson and Groves and such motivation only comes from Applicant's disclosure which is improper under M.P.E.P. §706.02(j) as discussed above. Myrick teaches geographical surveying using cameras in combination with flight computers to obtain images which overlay geographical coordinates. Applicant respectfully submits that there is no teaching or suggestion in Myrick or the other cited documents that their teachings may be combined so as to provide the present invention as recited in the claims and such motivation only follows from Applicant's disclosure. Even if it were proper to combine the

teachings of Hale, Ferguson, Groves and Myrick, they still will not provide the present invention as recited in Claims 4, 5 and 15. Claim 4 recites:

“wherein the vision sensors are infrared sensors, and wherein one of the infrared sensors has higher resolution than the others and is forward looking.”

Myrick in Figure 2 clearly shows that the sensors are looking down and are not forward looking as required by claim 4.

Claim 5 has been amended to recite:

“wherein the vehicle is an aircraft and wherein the higher resolution infrared sensor is located in the center of the array of vision sensors for a group including at least one of takeoff, air-to-air refueling and final approach and landing situations.”

Applicant respectfully submits that there is no teaching or suggestion in Hale, Ferguson, Groves or Myrick that the higher resolution infrared sensor is located in the center of the array of vision sensors for performing at least one of takeoff, air-to-air refueling and final approach and landing situations as provided by the present invention as recited in amended Claim 5.

Further, Claim 15 recites:

“wherein the array of vision sensors is forward-looking, and wherein the one other vision sensor is rearward-looking.”

As discussed above, Figure 2 of Myrick clearly shows the sensors looking down and Myrick does not teach or suggestion that the array of vision sensors is forward-looking and wherein one other vision sensor is rearward-looking as provided by the present invention as recited in Claim 15.

Additionally, Claims 4, 5 and 15 depend either directly or indirectly from independent Claim 1, and by virtue of that dependency, contain all of the features of Claim 1. Myrick adds nothing to the teachings of the other cited documents so as to render Claim 1 unpatentable. For all of the reasons discussed above, Claims 4, 5 and 15 are submitted to be patentably distinguishable over Hale, Ferguson, Groves and Myrick, whether considered individually or combined, and reconsideration and withdrawal of the §103 rejection of these claims is respectfully requested.

Claims 18 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hale in view of Ferguson, Groves, and further in view of Muller (U.S. Patent 4,057,782; hereinafter

Muller). This rejection is respectfully traversed. As previously discussed, Hale, Ferguson and Groves cannot be properly combined. Muller teaches a low altitude head-up display for aircraft and there is no teaching or suggestion that Muller can be combined with Hale, Ferguson and Groves so as to provide the present invention as recited in Claims 18 and 19. Such teaching or suggestion only follows from the present disclosure which is improper under the M.P.E.P. as discussed above.

Additionally, Claims 18 and 19 depend either directly or indirectly from independent Claim 1, and by virtue of that dependency, contain all of the features of Claim 1 and any intervening claims. Applicant respectfully submits that Muller adds nothing to the teachings of Hale, Ferguson and Groves so as to render independent Claim 1 unpatentable. Therefore, Claims 18 and 19 are also submitted to be patentably distinguishable over Muller, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of claims 18 and 19 is respectfully solicited.

Claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Hale, in view of Ferguson, Groves, Myrick and further in view of Kaneko (U.S. Patent 5,237,418; hereinafter Kaneko). This rejection is respectfully traversed. As previously discussed, Hale, Ferguson, Groves and Myrick are not properly combinable. Kaneko teaches an audio output circuit in an electronic apparatus with a composite display function. Applicant respectfully submits that there is no teaching or suggestion in the cited documents or Kaneko that their teachings may be combined so as to provide the present invention as recited in Claim 16. Additionally, Claim 16 depends indirectly from independent Claim 1. Applicant respectfully submits that Kaneko adds nothing to the teachings of Hale, Ferguson, and Groves so as to render independent Claim 1 unpatentable. For all of these reasons, Claim 16 is submitted to be patentably distinguishable over Hale, Ferguson, Groves, Myrick and Kaneko, whether considered individually or combined, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of Claim 16 is respectfully requested.

Claims 22-24, 26 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hale, Ferguson, Groves and further in view of Okamura et al. (U.S. Patent 5,572,343; hereinafter Okamura). This rejection is respectfully traversed. Okamura teaches a visual display having a see-through function and stacked liquid crystal shutters of opposite viewing angle

directions. Applicant respectfully submits that there is no motivation to combine the teachings of Okamura with Hale, Ferguson and Groves, and as previously discussed the combination of Hale, Ferguson and Groves is improper. Even if it were proper to combine the teachings of Hale, Ferguson, Groves and Okamura, they still would not provide the present invention as recited in the claims. Claim 22 has been amended to recite:

“wherein both the images generated by the output signal and the actual images are in conformity with one another, to create a seamless effect for the operator and wherein images generated by the output signal include an exterior view relative to the vehicle that is at least partially blocked by the actual images viewable by the operator but is displayable superimposed and in conformity with the actual images.”

As previously discussed, there is no teaching or suggestion in the cited documents that the images generated by the output signal include an exterior view relative to the vehicle that is at least partially blocked by the actual images viewable by the operator but is displayable superimposed and in conformity with the actual images as recited in amended Claim 22. Accordingly, Applicant respectfully submits that independent Claim 22 is patentably distinguishable over Hale, Ferguson, Groves and Okamura, whether considered individually or combined, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of Claim 22 is respectfully requested.

With respect to the rejection of Claims 23-24, 26 and 28 under 35 U.S.C. §103 as being unpatentable over Hale in view of Ferguson, Groves and Okamura, these claims recite additional features which further patentably distinguish over the cited documents. Additionally, these claims depend either directly or indirectly from independent Claim 22, and by virtue of that dependency, contain all of the features of Claim 22. Therefore, Claims 23, 24, 26 and 28 are also submitted to be patentably distinguishable over Hale, Ferguson, Groves and Okamura, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of these claims is respectfully requested.

Claim 25 was rejected under 35 U.S.C. §103(a) as being unpatentable over Hale in view of Ferguson, Groves, Okamura and further in view of Kroughlicof et al. (U.S. Patent 4,649,504; hereinafter Kroughlicof). This rejection is respectfully traversed. Kroughlicof teaches a non-contact sensing system for monitoring the position and orientation of rigid body in space having

at least three distinct point light sources mounted on the rigid body. At least two position sensor heads are fixedly mounted within detection range of light from the light sources, each position sensor head having a position sensor detector. (Abstract of Kroughlicof and Figure 1) Applicant respectfully submits that there is no teaching or suggestion that the optical position and orientation measurement system of Kroughlicof is combinable with Hale, Fergason, Groves and Okamura. Furthermore, as discussed above, Hale, Fergason and Groves are not properly combinable. Even if it were proper to combine these documents, they still would not provide the present invention as recited in Claim 25 as amended. Claim 25 has been amended to recite:

“wherein said tracking system comprises an emitter fixedly mounted on a helmet of the operator and a single detector disposed in space relation to said emitter.”

In contrast, Kroughlicof teaches a pair of position sensor heads 5 and 7 as shown in Figure 1 of Kroughlicof. Additionally, Claim 25 depends indirectly from independent Claim 22. Because of this dependency, Claim 25 contains all of the features of independent Claim 22 and all intervening claims. Therefore, Applicant respectfully submits that Claim 25 is also patentably distinguishable over the cited documents, and reconsideration and withdrawal of the Section 103 rejection of Claim 25 is respectfully requested.

New Claims 29-36 recite additional features which further patentably distinguish over the documents of record. Therefore, these claims are submitted to also be patentably distinguishable over the documents of record.

Conclusion

For the foregoing reasons, the Applicant respectfully submits that all of the claims in the present application are in condition for allowance. Reconsideration and withdrawal of the rejections and allowance of the claims at the earliest possible date are respectfully requested.

If the Examiner has any questions about the present Amendment or anticipates finally rejecting any claim of the present application, a telephone interview is requested.

If necessary, please charge any additional fees or credit overpayment to Deposit Account
No. 13-4365.

Respectfully submitted,

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